

<b>Study programme:</b> Bachelor studies – Mathematics			
<b>Course name:</b> Introduction to Probability			
<b>Lecturers:</b> Lenka Glavaš			
<b>Status:</b> Compulsory for the module Statistics, actuarial and financial mathematics			
<b>ECTS:</b> 5			
<b>Attendance prerequisites:</b> -			
<b>Course aims:</b> Learning objectives are: familiarizing with elementary concepts of probability theory.			
<b>Course outcome:</b> Student has acquired basic concepts of probability theory and has the ability to solve simpler problems that require the knowledge of probability theory.			
<b>Course content:</b> Random experiment, random events, relative frequency. The classical definition of probability. Additivity of probabilities. Sample spaces with finitely many or countably many outcomes, definition of probability as a real-valued set function. Conditional probability. The multiplication rule. Law of total probability, Bayes's formula. Independent events (pairwise and mutually independent events). Pairwise independence is weaker than mutual independence. Discrete random variable and its probability distribution. Bernoulli and binomial distribution. Sum of indicator random variables. Discrete random vector and its probability distribution. Independence of discrete random variables. Mathematical expectation of discrete random variable and its properties. Variance of discrete random variable and its properties. Bernoulli's law of large numbers. Chebyshev's inequality. Chebyshev's law of large numbers. Local and integral De Moivre – Laplace theorem. Normal distribution and its properties. Poisson distribution. Poisson limit theorem. Geometric probability. Bertrand's paradox. The Kolmogorov's axiomatics. Continuous random variable. Probability density function and cumulative distribution function. Properties of a CDF. Mathematical expectation and variance of continuous random variable. Independence of continuous random variables. Covariance and correlation coefficient. Normal distribution and central limit theorem.			
<b>Literature:</b> Павле Младеновић: <i>Елементаран увод у вероватноћу и статистику</i> , Друштво математичара Србије, Београд 1998. Јован Вукмировић, Павле Младеновић: <i>Теорија вероватноћа, задаци и проблеми</i> , Завод за уџбенике, Београд 2013. Sheldon Ross: <i>A First Course in Probability</i> , Pearson Prentice Hall 2010.			
<b>Number of hours:</b> 4	<b>Lectures:</b> 2	<b>Exercises:</b> 2	
<b>Teaching and learning methods:</b> Lectures (frontal). Classes and exercises (interactive).			
<b>Assessment (maximal 100 points)</b>			
<b>Course assignments</b>	<b>Number of points</b>	<b>Final exam</b>	<b>Number of points</b>
Lectures	-	Written exam	30
Exercises / Tutorials	-	Oral exam	40
Colloquia	-	Written-oral exam	-
Tests	30		
Essay / Project	-		